THE INFLUENCE OF CONSISTENT AND INCONSISTENT GUIDANCE ON HUMAN LEARNING AND TRANSFER

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CHAPTER I

INTRODUCTION

The Problem

The purpose of this study is to compare the influence of consistent and inconsistent guidance on human learning and transfer.

The motivation for the investigation may not be immediately clear. Certainly the literature gives the impression that the problem of consistency and inconsistency has been thoroughly investigated, particularly with regard to the effects of parental consistency or inconsistency toward their children. The last reported study on the problem appeared in 1952 (9). The unanimous conclusion seems to be that parental inconsistency has detrimental effects on a child's behavior, and the dominant theory explaining these detrimental effects seems to be one elaborated from Pavlov's classical work on experimental neurosis, i. e., that inconsistency strains the discriminative function. Thus it is perhaps not surprising to find statements such as the following in our text-books:

> Control . . . should be even and consistent and not marked by erratic variations dependent upon the mood of the parent or teacher. (3, p. 553).

> Inconsistency is perhaps the greatest evil. . . . Inconsistency makes it impossible for the child to learn what can and what cannot be done. (12, pp. 518-519).

> The boy who can learn to act like a man and to be a successful man when the time comes does so because everybody in his society agrees on how men should behave. . . . (11, pp. 18-19).

The studies of experimental neurosis strongly suggest that

> the poor integration and generally incoherent behavior of maladjusted persons may be due to too much strain on the discriminatory functions. . . . The more serious conditions of conflict of loyalties, inconsistency of emotional conditioning, vacillating discipline and erratic control may all be described as actively injurious to a proper degree of discrimination in adjustment. (16, p. 391).

> To be sure, even in normals, conflict and confusion (neurosis) may arise if undue strain is placed on the discriminatory ability. . . . Many children cannot see the difference between behavior (ostensibly the same) which is sometimes right, and sometimes wrong. Unable to fathom such inconsistencies, they are faced by a dilemma as real as that which confronted Pavlov's dog when it was unable to distinguish the elipse from the circle. (7, p. 141).

The above statements reflect a conviction concerning the settled status of the consistency-inconsistency problem. Yet a close look at the work that has been done in this area fails to reveal the basis for this degree of certainty. Direct data on inconsistency come primarily from case history and observational studies on children and their parents, studies too loosely designed to control for the effect of such complicating variables as parental rejection. The best data come from experiments in partial reinforcement during learning and extinction of responses. Except for one study using rat subjects (18), however, important transfer effects have not been considered. And with respect to theory, there is nothing in the literature to suggest a direct relationship between forced discrimination studies and those on inconsistency; indeed, Wilcoxon's (19) study, to be discussed later, casts doubt on such a relationship. It appears that little has been done in the way of isolating the variables of consistency and inconsistency in any study of their effects on human behavior.

The intent of this study, then, is to isolate and study the variables of consistency and inconsistency in a controlled laboratory setting.

The study is not designed to investigate the effects of parental consistency or inconsistency on children. Although primary interest is in the effects of parental consistency or inconsistency, it is important to test the specific effects of these variables apart from other conditions. It is entirely possible that it is some characteristic of the parent who is inconsistent, rather than the inconsistency itself, that is harmful to the child.

No explicit hypothesis is offered in this study. An attempt is made simply to answer the following question: If subjects are given consistent or inconsistent guidance while learning to solve a maze problem, in what ways will their learning behavior be affected both in the immediate learning situation and later when they are no longer being guided and are confronted with a similar but different problem to solve?

Related Literature

As noted above, direct data on inconsistency come primarily from case history and observational studies. Goodenough's (8) 1931 study on anger in young children seems to have been the first of such investigations. She had mothers keep detailed observational records of anger outbursts in their children, noting time, provocation, the child's behavior, etc. Goodenough found that, with one exception, every child for whom inconsistency of discipline appeared to be a factor of major importance belonged to the group of children in which anger outbursts were more than usually frequent. Baruch (2) also reports the effects of inconsistent discipline. In her study parents were interviewed psychiatrically by the investigator with the purpose of gaining information about the

interpersonal relationships existing between parents. The children of the parent subjects were then rated for adjustment by the investigator and by the head teacher in the school setting. Inconsistency in disciplinary methods between parents was seen as a factor in the adjustment of the child. Bühler (4) studied her own clinical cases, knowing both mother and child. Ratings based on utterances and/or objective observations of behavior were made for five behavioral items. Bühler found that mothers who are inconsistent in their demands on their children, or do not care at all, influence their children more adversely than do mothers who make very high demands on them. Meyers (15) subjected preschool children to conflicting commands in a play situation. The result was a fifty per cent drop in maturity of play in contrast with a twenty-five per cent drop in response to concurring commands. Baldwin, et al., (1) used the Fels Parent Behavior Scales to rate parental behavior toward children. They found that inconsistency figures in the rejecting parent's behavior toward his child, in that discipline, decisions, etc., are based on the parent's convenience. Friedlander (6) analyzed the case histories of children first seen in a children's clinic and later admitted to a state hospital. She found inconsistent control by parents to be a common element in these cases. Finally, Havighurst (9) found, as a result of an eight year study of the development of moral character in children, that moral competence was related to consistency of discipline rather than severity of discipline.

In attempting to evaluate these studies as a group, the major weakness which seems to stand out is that the variable of inconsistency is not isolated from the parent who is being inconsistent. The study by Baldwin,

et al., is a strong case in point, in which it is reported that inconsistency figures in the behavior of the rejecting parent. This suggests that inconsistency could be one avenue through which rejection is expressed, and that the inconsistency could be irrelevant but for the basic rejection which it conveys to the child. The question that could be asked of these studies is: Would inconsistency be damaging if administered by an accepting parent? In a sense Meyers' study offers a partial answer in showing that children can be affected by inconsistency administered by a somewhat uninvolved adult. But this study does not really answer the question; the report does not tell us how important a figure Meyers was to the children, and hence what the conflicting commands might have symbolized for them. Also, this study does not indicate whether the play regression was a manifestation of a momentary confusion, or whether it had any carry-over. In the end we are left knowing only that people who behave inconsistencly tend to affect people adversely. From these studies we still do not know whether or not it is the inconsistency itself which is having the adverse effect.

Studies in random reinforcement seem to give more dependable, although limited, information on the effects of inconsistency. The classic study is perhaps Humphreys' (10), in which he conditioned eyelid responses in human subjects. Giving one group one-hundred per cent reinforcement, another group fifty per cent random reinforcement, he found no differences in the acquisition of the eyelid response, but he did find that the response was significantly more difficult to extinguish in the randomly reinforced group. Now Humphreys' experiment as a study in learning per se is not particularly pertinent to the present investigation. The study is

pertinent, however, in that random reinforcement is another way of saying inconsistent reinforcement, and in that respect the experiment discloses what might be termed abnormally fixated behavior apparently related to the inconsistent reinforcement. The extinction behavior exhibited seems reminiscent of behavior exhibited by neurotic persons who year after year behave inappropriately to certain kinds of situations, i. e., behave in ways which were perhaps appropriate at one time but are no longer so because of changed external circumstances. And it very directly suggests that some neurotic behavior is related to some form of early inconsistency.

The results of two studies using rats as subjects supports such a suggestion. Wilcoxon (19) had as his purpose to factor out the variables present in N. R. F. Maier's (11) previous studies in frustration and response fixation. Maier had forced his rats to jump in a discrimination problem where discrimination was made impossible by inconsistent placement of cue cards, and found that position habits and "nervousness" developed. Maier felt that it was the insolubility of the discrimination that produced the behavior disturbance. Wilcoxon used Maier's jumping apparatus, and employed three treatments: (a) partial reinforcement *vs.* continuous reinforcement, both selective (capable of solution); (b) selective *vs.* non-selective partial reinforcement; (c) selective continuous reinforcement *vs.* non-selective partial reinforcement. He found that Maier was correct in saying that problem insolubility was disturbing to an animal, but that partial reinforcement was far more disturbing and was responsible for response fixation. Insolubility produced greater variation of response and more trials until fixation; but responses were more rigid as a result of partial reinforcement. Wike (18), also using rats, carried the problem a

step further by exploring the transfer effects of partial reinforcement. He found that rats conditioned to a response under a partial reinforcement regimen not only resisted response extinction longer, but in the mastry of a new problem tended to fixate more on outmoded responses.

The results of these studies are informative, as far as they go. The unfortunate thing about these studies is that we have no way of knowing how far we can extend the result from rats to human subjects. We are unable to know the importance of the human ability to symbolize and conceptualize, especially with regard to the transfer effects of inconsistency. Even if a human subject does respond immediately to inconsistency, and becomes confused and perseverative, will he carry this confusion and perseveration over to another problem? We frankly do not know. Extinction trials in a conditioning experiment do not seem to this writer to be the same as a new task.

The final conclusion drawn from the foregoing discussion of the pertinent literature is that while much work has been done on the problem of consistency and inconsistency, at best we have only suggestions about the effects of these variables on human behavior. Certainly there is strong reason to believe that inconsistent guidance in whatever form it takes, be it discipline, or reinforcements, or parental expectations, etc., has detrimental effects on behavior. But it appears that our facts do not allow us much more than a belief, and that there is need for more definite information. It is hoped that the present investigation will contribute in that direction.

CHAPTER II

PROCEDURE

Subjects

Eighty-eight college students, male and female, drawn from undergraduate psychology courses at the University of Florida and the University of Miami, served as subjects. They ranged in age from 18 to 25 years inclusive, with a mean age of 20 years. Students were allowed to serve as subjects only if they had not had a course in experimental psychology, and as far as could be determined all subjects were at the outset inexperienced in the type of task they were to do. Subjects were also only vaguely aware of the nature of the experiment when they arrived to serve in the experiment; that is, potential subjects were told only that they would be serving in a learning experiment in which there was no danger of physical harm.

Variations in intelligence and emotional stability were considered as possible disrupting variables, since some rather challenging maze learning, occasionally under stress, was involved. It was eventually felt that randomization would handle both of these variables by distributing them over the three experimental treatments involved in the experiment.

Apparatus

The maze: A ten turn Warden U type (17) stylus maze was used. It was constructed by cementing together two $11\frac{1}{2}$" by $13\frac{1}{2}$" rectangular shaped pieces of Masonite, and then cutting out slots to form the pattern using Warden's

dimensions. The pattern rested on a smooth base. This base contained four pegs, one at each corner, which fitted into corresponding holes in the corners of the maze itself, so that the maze board was held steady. This construction made it possible to insert and hold steady a piece of paper between maze and base on which the subject could leave a record of his path on each run through the maze. It was also possible, with this construction, to turn the maze over laterally so that the reverse pattern could be used in the transfer situation.

Maze templates: These were exact replicas of the maze, made of cardboard and used during the practice portion of the experiment when light signals were given to some of the subjects. Made to fit over the maze while it was being run, each turn was marked with red or green ink to indicate to the experimenter the proper signal to be given to the subject. There were sixteen of these templates, marked identically on each side for use with either side of the maze. The reason for having sixteen templates will become more clear when the method is described.

Shield: To obscure vision of the maze, a shield was constructed by stretching black crocus cloth over a wood frame, closing off three sides of a triangular tent-shaped structure. A flap at the bottom of one side allowed the subject free arm movement in running the maze. A small aperture in the cloth facing the subject allowed the experimenter to observe the face of the subject from the open side of the shield.

Signal lights: One green and one red light were suspended by means of iron brackets from the shield frame, facing the subjects at average eye level. These lights were wired to telegraph keys behind the shield which the experimenter operated. (See Figure 1).

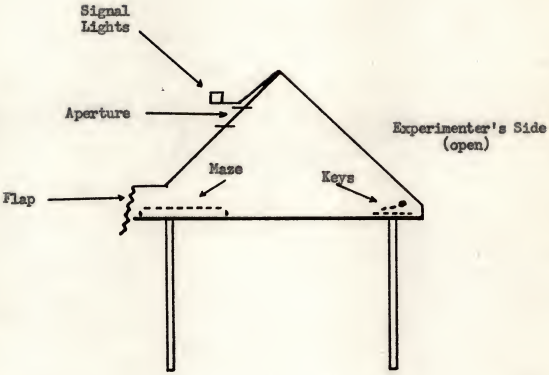

Figure 1. - Apparatus

Recording paper: An inexpensive grade of newsprint, cut to size, was used to insert between maze and base for subject to trace his path each trial.

Timing device: A ten-second-sweep stopwatch.

Method

Part I - Practice

As subjects appeared at the experimental room, one at a time, they were randomly assigned to one of three experimental groups, to be referred to as Group I, Group II, and Group C. Thirty subjects, male and female, were assigned to Groups I and C. Twenty-eight subjects were assigned to Group II.

When seated comfortably before the shield, all subjects were read the following explanation and instructions:

> This is an experiment in non-visual maze learning. The two mazes you will be required to learn are constructed of boards out of which slots have been cut to form connecting pathways from a starting point to a goal. Branching off from these pathways are other pathways which lead into blind alleys. Let me show you what I mean. Looking at this diagram (see Figure 2) you can see if you turn this way you just run into a blind alley. However, if you turn this way you get up into the next set of alleys, and so on up to the goal. Now, you are to run a stylus, which is like a pencil, through these pathways, attempting to learn to run directly through the maze without entering blind alleys. Your eventual aim is to be able to run the stylus from start to goal without error, i. e., without entering a blind alley. Each time you go through the maze you are to go through as quickly as you feel able to. Both of these lights will flash when you reach the goal at the end of each run.
>
> The entire experiment consists in learning two mazes. During the first half of the experiment you will attempt to learn maze 1, in the second half maze 2. Any questions?

In addition, subjects in Groups I and II were read the following between the first and second paragraphs:

> Watch the lights! When the green light flashes you have made a correct turn. When the red light flashes you have made a wrong

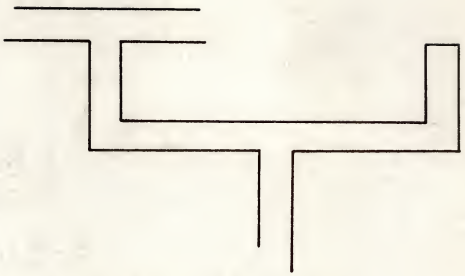

Figure 2. - Demonstration Sample of Maze Section

turn. Both lights will flash, you will recall, when you reach the goal at the end of each run.

Subjects were then asked to reach the hand they wished to use under the flap, the stylus was placed in the hand, and the point of the stylus guided to the starting point. All subjects were allowed to run for fifteen trials. Each trial was separated by thirty to sixty seconds in which time the paper under the maze and, where necessary, the template were changed. Whether or not an errorless run had been achieved in fifteen trials, subjects were stopped and switched to the reverse maze pattern. The two sides of the maze board were presented in counterbalanced order for original learning.

As implied in the instructions, only Groups I and II received light signals as guidance; Group C subjects received no guidance and served as controls. Guidance was given in this way: Subjects in Group I were given signals according to instructions at eight of the ten turns on each run, immediately after making a definite and deliberate turn into an alley. Unknown to the subjects, no signals were given at two turns each run, these turns varying from trial to trial according to a prearranged pattern.[1] To guide the experimenter in giving signals, one template was used on which the correct signals were marked for each turn; the markings were simply covered where signals were to be omitted. Thus, subjects in this group were given what was considered to be relatively consistent guidance. Group II subjects received what was considered to be inconsistent

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[1]Signals were omitted at two of the ten turns on each run in an attempt to simulate a real life situation. That is, in real life, even where guidance is entirely consistent, guidance is hardly given for every act. Guidance is consistent only when guidance is given, i. e., when guidance is given it is always the same for the same act.

guidance. They not only received no guidance at two of the ten turns (in the same prearranged pattern given Group I), but unknown to them they also received wrong signals at three of the ten turns on each run. That is, they were given red signals for correct turns, green signals for wrong turns. These incorrect signals were also given at varying points in the maze according to a prearranged pattern (see Figure 3). A separate template was necessary for each of the fifteen trials to guide the experimenter in giving signals.

Part II - Transfer

If a subject was able to achieve an errorless run before he had completed fifteen trials, he was asked to run a few more trials until he had completed fifteen. In most instances, however, the criterion was not reached, and subjects were told that while they had not quite finished the first maze we were going to switch to the second. All subjects were then told that they were now to attempt to learn a different but similar maze, and that their problem was the same, i. e., to learn to go through the maze without error. Groups I and II were told in addition that on this maze the only lights they would see were those at the end of each run. Subjects were allowed to run unguided until they reached a criterion of one errorless run. In a few instances subjects became too upset to complete the experiment, or had to stop because of time limitations. The records of these subjects were not included in the tabular data, but will be discussed in the chapter on results.

Turns	Trials 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	C	N	C	I	C	C	I	C	C	I	N	C	I	N	C
2	C	C	I	C	N	I	N	N	C	I	C	C	N	C	I
3	C	I	N	N	C	I	C	N	N	C	I	C	C	C	I
4	C	N	C	C	I	C	C	C	I	C	I	N	I	I	N
5	N	C	I	C	I	N	C	I	C	N	C	C	C	I	I
6	N	I	C	C	C	C	I	C	I	N	C	I	I	N	C
7	I	C	C	N	I	C	N	I	C	C	C	I	N	C	C
8	I	C	I	C	C	N	C	I	I	C	I	N	C	C	C
9	C	I	N	I	C	C	I	C	C	I	N	I	C	C	C
10	I	C	C	I	N	I	C	C	N	C	C	C	C	I	N

Key C means correct signal

I means incorrect signal

N means no signal

Figure 3 - Light Signal Pattern for Group II
(Inconsistent Guidance)

Part III - Interrogation

After subjects had completed an errorless run on the transfer maze they were asked to answer a few informal questions about their impressions while attempting to solve the mazes. They were asked for impressions of the experiment itself, and of what the experimenter was doing behind the shield. An attempt was made at first to ask all subjects the same non-leading questions, but it was soon found that subjects differed markedly in their ability to understand and answer such questions, and that it was necessary to pattern questions to the subject. Thus, if a subject was unable to answer such a general question as: "What impressions did you have as you went through the experiment?", it might be necessary to ask more specific questions about the different aspects of the procedure. A typical question was: "Did you have any impressions about the different mazes?" Or even more specific, "Did you feel one maze was more difficult than the other?" In all cases the questioning was informal without biasing answers. The purpose of this interogation was to gain some information about the subject's performances which might not be apparent in the objective data.

Measurements

Quantitative measures were taken on the following:

Errors: These were taken from the tracings made by the subjects. An error was scored if a definite intentional entry of over one-fourth of an inch was made into a blind alley. The qualification "definite and intentional" was felt to be necessary because often subjects pressing hard against a wall of a slot overshot unintentionally into blind alleys. The record of such an error was quite different from that of an intentional error.

The tracings allowed tabulation not only of errors per trial which could be summed to give total errors, but also errors per choice point, from which it was felt that a measure of perseveration of errors could be had.

Trials to criterion of one errorless run.

Time per trial.

Although not quantitative, it should be noted that throughout the experiment notes were taken of the spontaneous verbalizations and behavior of the subjects.

CHAPTER III

RESULTS

Statistical Treatment of the Data

Means and variances were computed for group distributions of total errors and total time, for both the practice and transfer mazes. In addition, means and variances were computed for group distributions of trials to criterion on the transfer maze. This latter computation was not possible for the practice maze, since only a small percentage of the subjects reached the criterion of one errorless run by the fifteen trials, the point at which all subjects were stopped. Instead, the percentage of subjects in each group who reached this criterion was computed and the group percentages compared using the chi-square method.

F ratios were computed to determine the significance of differences between group variances for each measure. Where variances did not differ significantly, the usual method of obtaining critical ratios was employed to determine the significance of differences between group means for each measure. If variances did differ significantly, the procedure suggested by Edwards (5) was employed to determine significance of differences between group means. Two-tailed tests of significance were used throughout, and probabilities of 5 per cent were required for minimum significance. The results are summarized in Tables 1 - 4.

Part I - Practice

Errors. Mean total errors for Group I on the first maze task was 51.77,

TABLE 1

MEANS AND STANDARD DEVIATIONS
OF PRACTICE MAZE PERFORMANCES

Group	Errors		Time	
	Mean	Standard Deviation	Mean	Standard Deviation
I	51.77	12.43	425.30	157.83
II	86.43	13.22	668.57	324.67
C	56.50	11.66	523.70	212.54

TABLE 2

F RATIOS AND ts FOR PRACTICE
MAZE PERFORMANCES

Groups	Errors				Time			
	F	P	t	P	F	P	t	P
I--II	1.13	>0.05	10.22	<0.01	4.23	<0.02	2.76	<0.01
I--C	1.14	>0.05	1.60	>0.05	1.81	>0.05	2.14	<0.05
II--C	1.28	>0.05	9.11	<0.01	2.33	>0.05	2.91	<0.01

with an S. D. of 12.43; for Group II the mean was 86.43, with an S. D. of 13.22; for Group C the mean was 56.50, with an S. D. of 11.66.

The F ratio of the variances of Groups I and II was 1.13; of Groups I and C, 1.14; of Groups II and C, 1.28. None of these Fs is significant. The t between the means of Groups I and II equalled 10.22, significant for 56 d. f. beyond the 0.01 level. Between Groups I and C, t equalled 1.60,

TABLE 3

MEANS AND STANDARD DEVIATIONS OF TRANSFER MAZE PERFORMANCES

Group	Errors		Time		Trials	
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
I	48.10	30.72	368.20	212.27	16.06	7.46
II	109.14	68.19	663.86	482.82	32.75	25.61
C	57.00	47.98	403.93	243.75	19.40	15.16

TABLE 4

F RATIOS AND ts FOR TRANSFER MAZE PERFORMANCES

Groups	Errors				Time				Trials			
	F	P	t	P	F	P	t	P	F	P	t	P
I - II	4.92	< 0.02	4.34	< 0.01	5.17	< 0.02	2.98	< 0.01	11.89	< 0.02	3.32	< 0.01
I - C	2.44	< 0.02	0.86	> 0.05	1.31	> 0.05	0.63	> 0.05	4.14	< 0.02	1.14	> 0.05
II - C	2.02	> 0.05	3.34	< 0.01	3.92	< 0.02	2.56	< 0.02	2.85	< 0.02	2.39	< 0.05

not significant for 58 d. f. Between Groups II and C, t equalled 9.11, significant for 56 d. f. beyond the 0.01 level.

Time. Mean total time for Group I was 425.30 seconds, with an S. D. of 157.83; for Group II the mean was 668.57 seconds, with an S. D. of 324.67; for Group C the mean was 523.70 seconds, with an S. D. of 212.54.

The F ratio of the variances of Groups I and II was 4.23, significant beyond the 0.02 level. Between Groups I and C the F of 1.81 is not significant. Between Groups II and C the F of 2.33 is likewise not significant. The t for the difference between means of Groups I and II was 2.76, significant for 56 d. f. beyond the 0.01 level. For Groups I and C the t of 2.14 is significant for 58 d. f. beyond the 0.05 level. For Groups II and C the t of 2.91 is significant for 56 d. f. beyond the 0.01 level.

Trials to criterion. Only nineteen of the eighty-eight subjects made one errorless run during the fifteen trials. Of these nineteen, eleven subjects were in Group I, eight in Group C, and none in Group II. Using Group I as the criterion group, and correcting for continuity, the chi-square for the difference between proportions of Groups I and II was 14.05, significant beyond the 0.01 level. Still using the proportion of Group I which succeeded in reaching the criterion as the expected proportion, the corrected chi-square for Groups I and C was 0.90, which is not significant. Between Groups II and C, using the Group C proportion as the expected proportion, the corrected chi-square of 9.84 is significant beyond the 0.01 level.

Behavior observations. In spite of the individuality of each subject, group behavior patterns did seem to emerge.

Group I subjects seemed to show a strong tendency to become dependent upon the lights during the early trials. They demonstrated this dependency mainly in pausing slightly just after entering an alley and resuming their former pace immediately after receiving the light cue. Toward the end of the fifteen trials they still heeded red cues and reversed their paths, but they seemed less inclined to wait for cues on entering alleys.

Group II subjects seemed more characteristically confused by the light cues during the early trials. They soon began to test the cues by continuing along an alley where they had received a red light, and by reversing their directions when they received a green light. Following this testing period, subjects tended to behave in one of three grossly different manners in relation to the cues: One group of subjects defied the instructions and openly ignored the lights, a second group became uncertain about them and alternately followed and ignored the cues, and a third group seemed to give up trying to understand the lights and followed them passively.

Group C subjects seemed simply to work at the task in a business-like manner.

Part II - Transfer

Errors. Mean total errors for Group I was 48.10, with an S. D. of 30.72; for Group II the mean was 109.14, with an S. D. of 68.19; for Group C the mean was 57.00, with an S. D. of 47.98.

The F ratio of the variances of Groups I and II was 4.92, significant beyond the 0.02 level. For Groups I and C the F of 2.44 is likewise

significant beyond the 0.02 level. Between Groups II and C, the F of 2.02 fails to be significant. The t of the difference between the means of Groups I and II was 4.34, significant for 56 degrees of freedom beyond the 0.01 level. Between Groups I and C, the t of 0.86 is not significant for 58 d. f. Between Groups II and C the t of 3.34 is significant beyond the 0.01 level for 56 d. f.

Time. Mean total time for Group I was 368.20 seconds, with an S. D. of 212.27; for Group II the mean was 663.68 seconds, with an S. D. of 482.82; for Group C the mean was 403.93, with an S. D. of 243.75.

The F ratio of the variances of Groups I and II was 5.17, significant beyond the 0.02 level. For Groups I and C the F of 1.31 is not significant. For Groups II and C the F was 3.92, significant beyond the 0.02 level. The t of the difference between the means of Groups I and II was 2.98, significant beyond the 0.01 level for 56 d. f. Between Groups I and C the t of 0.63 is not significant for 58 d. f. Between Groups II and C t was 2.56, significant beyond the 0.02 level for 56 d. f.

Trials to criterion. Mean trials to criterion for Group I was 16.06, with an S. D. of 7.46; for Group II the mean was 32.75, with an S. D. of 25.61; for Group C the mean was 19.40, with an S. D. of 15.16.

The F ratio of the variances of Groups I and II was 11.89; for Groups I and C, F was 4.14; for Groups II and C, F was 2.85. All are significant beyond the 0.02 level. The t of the difference between the means of Groups I and II was 3.32, significant beyond the 0.01 level for 56 d. f. Between Groups I and C the t of 1.14 is not significant for 58 d. f. Between Groups II and C t was 2.39, significant beyond the 0.05 level for 56 d. f.

Behavior observations. Subjects in Groups I and C tended to approach and deal with the transfer maze with apparent confidence in their knowledge of what was to be done.

Group II subjects again seemed to behave in one of three grossly different manners. Those subjects who had ignored the light cues toward the end of the practice maze tended to behave as did subjects in Groups I and C, performing as well as the more proficient members of those groups. Those who were uncertain and ambivalent about the cues tended to be somewhat confused in dealing with the transfer maze, frequently fixating and perseverating on certain of their errors. Finally, those who tended to follow the light cues passively tended on the transfer maze to be rather without purpose or orientation, fixating on certain of their errors and perseverating almost endlessly.

Subjects failing to complete the transfer maze. Eleven subjects who began the experiment were unable to reach the criterion on the transfer maze before having to discontinue. They represented fairly evenly all three groups; three were in Group I, four in Group II, and four in Group C. The reasons for discontinuing were either that the subjects became too frustrated to continue, or that they or the experimenter ran out of time (although all subjects were allowed at least one hour in which to complete the experiment). Characteristically they were subjects who very early on the transfer maze fixated on certain of their errors and perseverated until they asked to leave or were stopped by the experimenter. When questioned they had little to offer toward explaining their difficulty except to say that they tended to feel that there were several paths to the goal. The writer finds himself able to offer little more in the way of an explanation. Since these subjects were so evenly distributed over the three

variables, it is suggested only that some unknown variable in the subjects themselves was operating to prevent them from eliminating their errors.

Part III - Interrogation

Asked for impressions of the experiment, Group I subjects characteristically voiced the feeling that the second maze, i. e., the transfer maze, was easier. They felt, first of all, that initially on the practice maze they were not quite sure of what they were doing, but that by the time they were transferred to the second maze they were better oriented to the task. They felt, however, that what really made the first maze more difficult was the presence of the light cues. The lights did help by preventing them from going too far into blind alleys and having their images of the correct path disrupted, but for the most part they were distracting. They found themselves leaning too heavily on the lights and not paying enough attention to the maze pattern. About what the experimenter was doing they had little to say beyond noting that he was changing the papers under the maze, keeping time, recording errors, etc.

As a group, subjects in Group II tended to agree with Group I subjects in feeling that the second maze was easier, and for the same reasons. But once again they tended to respond to questioning in one of three grossly different ways. Those who had ignored the lights stated matter-of-factly that aside from being distracting the lights were confusing in giving them wrong information. For this reason they ignored the lights after several trials. They had little to add to what Group I subjects had to say about what the experimenter was doing. The group that was ambivalent about the lights tended to be less open in their criticism

of the light cues. In somewhat hesitant, embarrassed tones they ventured the opinion that the lights may have given them wrong information at times, but they hastened to add that in all probability they had just misunderstood the lights or instructions. In giving their impressions of what the experimenter was doing they were most interested in knowing whether the lights were mechanically operated or were operated by the experimenter. Finally, the group that tended to follow the lights passively felt in contrast that the first maze was easier. They felt that the lights were helpful in giving them some idea of whether or not they were on the right track. They felt that lights would have helped on the second maze.

Group C subjects tended to have very little to say about the experiment or the experimenter, except that the second maze seemed easier because they had had the prior experience of trying to solve the practice maze.

Discussion of Results

The results strongly suggest that the inconsistent guidance given Group II subjects had a significantly detrimental influence on their maze performances. In every instance their mean performance was inferior to those of the other two groups. It would seem, then, not unreasonable to conclude that in terms of this investigation inconsistent guidance has grossly detrimental effects on both immediate and subsequent learning behavior.

The writer hesitates, however, to draw such a conclusion. The magnitude of Group II variances, particularly those of their transfer maze performances, forces the awareness that subjects in this group were not

very uniformly affected by the inconsistency. This wide variation in performance suggests to the writer that before drawing any conclusions about the effects of inconsistent guidance it would be wise to understand the source and nature of the Group II variances.

The first suggestion which presents itself is that the variability shown by Group II is a consequence of this group's being drawn from a strikingly different population. But this suggestion is not too convincing, for aside from the fact that subjects were assigned randomly to the group, the group variances are not too different for practice maze performances. Variances are almost identical for practice errors, and Group II differs only from Group I on total time. So there is some reason to question the possibility that Group II subjects came from a different population.

Two other possibilities present themselves. First, the variable of inconsistency could have produced the variation, and second, the inconsistency could have brought into play personal variables which determined highly individual performances. The behavioral data suggest that these are possibilities worth considering in detail.

It will be recalled from the behavioral data that Group II subjects did not seem to behave as a group. Initially confused by the light cues on the practice maze, they soon tended to behave in one of three manners: they defied the instructions and ignored the lights, or they were uncertain and ambivalent about following the lights, or they became passively dependent upon the lights. On the transfer maze the quality of their performances was roughly correlated with the degree to which they had ignored the lights on the practice maze. Afterwards, when asked for impressions of the experiment and the experimenter, those who had ignored the lights

tended to be more outspoken in their disdain for the cues than did those that were ambivalent about them; the ambivalent group tended to blame themselves for their confusion, and to wonder whether the lights were mechanically operated or were operated by the experimenter. Those who had followed the lights passively felt that the lights were helpful.

It seems then that the inconsistent cues provoked three grossly different personal reactions, i. e., a defiant and rebellious one, a confused and ambivalent one, and a passive one. It seems further that it was not the inconsistency itself which produced the large variability in Group II performance, but rather the reactions of the subjects which the inconsistency provoked; for it seems that Group II subjects were reacting and performing more as three separate and unique groups than as a single homogeneous group. (A legitimate question at this point would of course be: if it is true that the reactions of the subjects, and not the inconsistency itself, produced the large variability, why isn't the variability of Group II much different from that of the other groups on the practice maze? The writer has no certain answer to this question. It is only suggested that inasmuch as the inconsistent guidance had an initial confusing effect on all of the Group II subjects, all of the subjects started out pretty much with the same handicap, and the fifteen trials allowed did not provide adequate time for the differences to show themselves.)

If the foregoing analysis of Group II's excessive variances is correct, then it would seem inaccurate to conclude that the inconsistent guidance given in this experiment had, per se, gross damaging effects on learning behavior. It could be said that the inconsistency was disturbing

at the very time it was being given, but it could not be claimed that the inconsistent guidance necessarily had lasting damaging effects. Lasting damage seemed to occur mainly when the subject reacted to it in certain ways, i. e., with ambivalence or passivity. Lasting effects did not seem present where subjects questioned the light cues seriously and rebelled against them. It would seem necessary to conclude then that inconsistent guidance, at least in terms of this experiment, has the immediate effect of confusing the recipient, but that its effects are temporary unless the recipient is unable to rebel against the inconsistency.

But why should a subject react ambivalently or passively when at some point he must be aware that the guidance being given is misleading? The behavioral data offer only a clue to the possible answer to this question, but seemingly an important one. It will be recalled again that during the interrogation part of the experiment Group II subjects differed in the degree to which they could be open and frank about their feelings toward the lights. Some were matter-of-fact about their feelings, some were hesitant and embarrassed about accusing the experimenter of deceiving them, tending even to blame themselves for their confusion, and some not only avoided accusing the experimenter of deception but misperceived the situation as being helpful. The impression of the experimenter was and is that these subjects were more or less afraid of offending the experimenter, and/or making themselves appear ridiculous. They were more or less afraid that if they questioned the guidance and hence the experimenter they would be punished. And since the experimenter did nothing to encourage such feelings, the feelings must necessarily have stemmed from personal misperceptions of the relationship between themselves and the experimenter. For

personal reasons they must have felt uncertain enough in the relationships with themselves and/or with the experimenter to feel that it was important not to question the experimenter too seriously if at all, the safest reaction being complete passivity.

Assuming now that conditions are favorable for inconsistency to have a detrimental effect, i. e., assuming a subject reacts to inconsistent guidance by becoming ambivalent or passive, how does inconsistent guidance do its damage? On this point the data offer only meagre assistance. It seems possible to speculate, following Ludgate (13), that excessive guidance encourages a passive attitude in subjects which results in inferior, passive learning. But if this were the case how could, e. g., the superior performance of Group I be explained? The same amount of guidance was given to each group. Possibly there is a clue in the observation that, in spite of their strong initial dependency on the lights, Group I subjects showed less inclination to be dependent toward the end of the fifteen trials while those subjects in Group II who were adversely affected became more and more dependent. Group II subjects could be said to have developed more intensely passive attitudes and to have engaged in more passive learning, emerging from the practice maze without a picture of the maze that could be utilized in learning the transfer task.

To complete this discussion of the results it seems important to look briefly at the results of Groups I and C. In the light of Ludgate's study, in which she guided subjects manually through the correct path of a maze and found that performance was impaired by excessive guidance, it might be asked why it was that Group I not only did not do worse than Group C but tended to do slightly better. It seems possible to speculate that

if for no other reason the results could differ from Ludgate's because the guidance was given differently in the two experiments. In the present experiment subjects were not literally guided as they were in Ludgate's experiment; they were only given information. Perhaps again, as in the case of Group II, the determinant was whether or not subjects felt impelled to use the guidance, and impelled to assume a passive attitude. Specifically, in relation to Group C, it might also be recalled that Group I subjects tended to feel that in one sense the guidance was helpful in keeping them from going too far into blind alleys and having their images of the correct path disrupted.

Finally, it is interesting to note and ask why the tendency toward significantly greater variance in Group C performance in spite of insignificant differences in actual performance. Because of the many similar variances there is little reason to question the populations from which the groups were drawn. It can only be suggested that along with encouraging a passive attitude the consistent guidance encouraged greater conformity of performance. No guidance, on the other hand, perhaps allowed subjects to develop whatever potentials they had.

CHAPTER IV

SUMMARY AND CONCLUSIONS

The purpose of this study was to investigate the influence of consistent and inconsistent guidance on human learning and transfer. The study was motivated by the fact that while the literature suggests that the problem of consistency and inconsistency is a settled affair, particularly as regards the effects of inconsistent parental behavior toward children, the actual work done on the problem fails to reveal the basis for the presumed settled status of the problem. The reported studies on the effects of inconsistency all point to the conclusion that inconsistency in whatever form it is administered has a detrimental effect on behavior, but the studies which point to this conclusion appear to be lacking in controls, so that it is difficult to know, e. g., whether it is the inconsistency itself, the person administering the inconsistency, or some other condition which is causing the damage. Related studies on partial reinforcement, while they tend to support the contention that inconsistency is damaging, are only suggestive because they study infrahuman subjects and do not deal with transfer effects. The intent of this study, then, was to isolate and study the effects of consistent and inconsistent guidance in a controlled laboratory setting in an attempt to gain some needed information on the effects of these variables without deliberately attempting to support or reject any hypothesis. An attempt was made simply to answer the question: If subjects are given consistent or

inconsistent guidance while learning to solve an initial maze problem, in what ways will their learning behavior be affected both in the immediate learning situation and later when they are no longer being guided and are confronted with a similar but different problem to solve?

Eighty-eight college students, male and female, under 26 years of age, and essentially inexperienced with maze problems, served as subjects. As each subject appeared to serve in the experiment he or she was assigned randomly to one of three groups, known as Groups I, II, and C. Subjects were then seated before a shield which obscured the apparatus and the experimenter. They were given a general description of the type of maze they were to learn, and told that their purpose was to learn to run the stylus which they would be given from start to goal without error. They were told further that when they reached the goal both the red and the green lights suspended before them would flash. In addition, subjects in Groups I and II were told to watch the lights, for when they made a correct turn the green light would flash, and when they made a wrong turn the red light would flash. The stylus was placed in the hand extended under a flap in the shield, guided to the starting point of the standard ten-turn Warden U-type maze employed, and the subject was told to start. Light cues were given subjects in Group I according to instructions, but unknown to Group II subjects, the light cues given them were wrong at three of the choice points on each trial. Also, the choice points at which wrong cues were given were varied from trial to trial according to a prearranged pattern. Group C subjects were given no guidance. Whether or not subjects reached the criterion of one errorless run, all subjects were allowed to run fifteen trials, after which all were stopped and transferred to the

lateral reverse of the practice maze pattern. Here they were told that their task and purpose was the same, but that the only lights they would see were those at the end of each trial. All subjects were then allowed to run until they had reached the criterion of one errorless run. Records were kept of errors and time per trial, and trials to criterion, and notes were taken on spontaneous behavior exhibited. Following completion of the maze problem, subjects were asked for their impressions of the experiment and of the activities of the experimenter, in an attempt to gain some information which might not be apparent in the objective data.

Group II mean total errors and time were significantly greater than those achieved by Groups I and C, both on practice and transfer mazes. A significantly smaller proportion of Group II subjects reached the criterion within fifteen trials on the practice maze, and Group II required significantly more trials to reach the criterion on the transfer maze. Group II variances also tended to be significantly greater than those of the other two groups. Group I performed slightly but insignificantly better than did Group C, but in a few instances Group C variances were significantly greater than those of Group I. The behavioral data characterized Group I subjects as initially dependent upon the light cues but as gradually showing less dependence upon them although still heeding them. Group II subjects were more characteristically confused by the lights at first, and then reacted to them in one of three ways: either they rebelled and ignored the lights, or they were confused and ambivalent about them, or they followed them passively. Group II subjects also seemed more or less uneasy about verbalizing doubts about the accuracy and usefulness of the cues, and their transfer maze performance seemed roughly correlated

with the degree to which they had ignored the lights on the practice maze. Group C subjects characteristically approached the mazes in a matter-of-fact, business-like manner.

It was felt that before concluding from the results that the inconsistent guidance had gross detrimental effects on learning behavior, the excessive variance shown by Group II would have to be accounted for. A consideration of the behavioral data led to the conclusion that the excessive variance could well be attributed to the group's behaving as roughly three separate and unique groups rather than as a single homogeneous group, with transfer maze performances varying from very good to very poor in quality. Considering that these three sub-groups grew out of personal reactions to the inconsistent cues, it appeared inaccurate to conclude, in spite of the quantitative results, that the inconsistent guidance had gross damaging effects. It was considered more in keeping with the data to conclude that while the inconsistent guidance was confusing to all Group II subjects at the time it was being given, lasting damage to behavior resulted mainly when subjects were unable to rebel against the instructions and to ignore the lights. It was suggested on the basis of behavioral data that subjects who were unable to rebel against the misleading cues behaved as they did out of fear of offending the experimenter and/or making themselves appear ridiculous. It was further suggested that when subjects did not rebel but rather assumed passive attitudes toward the light cues, their learning was passive and they emerged from their experience on the practice maze with little useful information which they could apply in dealing with the transfer maze. Variance differences between Groups I and C were considered as stemming from a

conformity encouraged in Group I by the consistent guidance, and absent in Group C where no guidance was given.

What answers can be given now to the question this experiment was designed to answer? What is the influence of consistent and inconsistent guidance on human learning and transfer? Within the limits of this experiment, i. e., considering the nature of the learning problem, the type of guidance given, and the limitations inherent in studying a college population, the following statements seem justified:

1. The influence of consistent guidance is not markedly different from that of no guidance at all.

2. While inconsistent guidance is being given it has a confusing and generally detrimental influence on learning as compared with the influence of consistent or no guidance.

3. Inconsistent guidance does not necessarily have lasting damaging influence on learning behavior.

4. Lasting damage results from inconsistent guidance when the recipient of the guidance is for some reason unable to rebel and ignore the guidance.

Implications for Future Research

The writer would like very much to see this experiment repeated in exact detail, not so much for the quantitative results as for the behavioral results. For should it be borne out that inconsistent guidance is detrimental only when the recipient is unable to rebel and ignore the guidance, then there would be good reason to believe that the crucial element, in a situation in which inconsistent guidance is being given, is the

relationship between the guide and the guided. There would be reason to believe that the inconsistent guidance has small importance when there is enough freedom felt in the relationship for the guided person to question and find out about what is confusing him. And there would be important reasons to conduct research on the influence of inconsistent guidance in various kinds of interpersonal relationships. For instance, it would seem important to conduct a study wherein inconsistent guidance was given by persons with different personality make-ups such as a very domineering, authoritative person, an ambivalent person, and a permissive person. These different persons might be varied with different kinds of subjects, such as very secure and independent, or very insecure, passive, and dependent subjects.

The results of such studies could be very illuminating, for it could well be demonstrated that, e. g., parental inconsistency is relatively harmless if the parent's attitude toward the child is such as to afford the child enough security in the relationship to question the inconsistency. And this would be important to know, for it would take the emphasis from the act and place it where it truly seems to belong, on the human interpersonal relationship.

APPENDIX

TABLE 5

TOTAL ERRORS - PRACTICE

Group I	Group II	Group C
21	58	29
35	65	39
35	68	41
35	70	41
36	71	46
36	75	48
42	75	48
43	80	50
46	82	51
48	82	52
50	83	52
51	83	53
51	86	53
51	86	54
51	86	54
54	88	55
56	88	56
56	90	57
56	93	59
56	95	61
59	96	63
59	97	64
59	100	64
61	100	68
63	103	69
63	104	70
67	105	70
68	111	74
68		75
77		79

TABLE 6

TOTAL TIME - PRACTICE

Group I	Group II	Group C
195	335	250
243	355	252
246	356	268
255	375	296
288	411	300
291	415	334
296	429	355
335	454	380
340	454	390
348	462	396
357	468	424
357	483	440
373	566	456
380	573	472
384	574	498
388	582	503
411	591	522
417	665	545
425	689	556
428	724	577
435	796	588
446	923	592
522	934	597
535	982	600
553	1102	605
575	1238	661
643	1291	873
673	1490	937
705		992
915		1051

TABLE 7

TOTAL ERRORS - TRANSFER

Group I	Group II	Group C
10	14	9
15	19	12
17	21	13
18	26	14
19	32	20
20	36	22
23	39	23
24	39	25
25	46	29
29	48	32
33	50	33
36	51	40
37	54	41
38	67	41
42	72	43
42	92	44
43	109	47
46	127	48
48	135	48
48	152	53
49	154	59
54	165	62
61	186	65
74	201	77
76	220	89
77	222	93
95	304	114
97	375	133
119		152
128		229

TABLE 8

TOTAL TIME - TRANSFER

Group I	Group II	Group C
73	113	121
117	115	154
150	173	158
167	200	162
179	233	175
194	245	182
202	250	187
241	282	187
245	289	209
252	309	210
275	327	301
311	340	301
339	365	317
349	367	334
351	579	342
354	608	349
363	659	379
364	722	395
369	750	403
377	1058	406
377	1079	456
380	1094	511
381	1163	518
390	1294	573
406	1304	590
522	1304	724
686	1636	737
720	1670	782
729		829
1153		1126

TABLE 9

TRIALS TO CRITERION - TRANSFER

Group I	Group II	Group C
6	6	5
6	7	5
6	9	5
6	10	6
7	11	8
7	12	8
8	13	8
8	14	10
8	16	10
9	16	11
9	18	12
10	18	12
11	19	12
11	24	14
14	24	16
15	27	16
17	30	17
17	33	18
19	36	18
19	43	19
20	44	20
21	45	21
21	55	23
22	56	25
24	67	26
25	72	34
28	90	38
31	102	43
31		48
32		74

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BIOGRAPHICAL ITEMS

The writer was born on March 10, 1924, in Chicago, Illinois. He graduated from Lane Technical High School, Chicago, Illinois, in 1942. He attended the University of Illinois, and received the Bachelor of Science (Zoology) degree in 1948. Graduate studies were pursued at Loyola University (Chicago) where, in 1953, he received the Master of Arts degree (Psychology). In September, 1952, he entered the University of Florida to continue his graduate studies in Psychology.

From 1943 to 1946 the writer served in the Army of the United States. While in the Army he held the position of surgical technician, and achieved the rank of Technician 4th Grade. From 1949 to 1950 he served a clinical psychology internship at Chicago State Hospital, Chicago, Illinois. In 1950 he was appointed to the position of Staff Clinical Psychologist at the same hospital, and he held this position until March, 1952. From March to September, 1952, he held the position of Staff Clinical Psychologist at the Illinois State Training School for Boys, St. Charles, Illinois. From 1953 to 1955, while at the University of Florida, he held the position of Graduate Assistant in the Psychology Department of the University. From June, 1955, to the present he has been serving a Veterans Administration Psychology Traineeship at the V. A. Mental Hygeine Clinic, Miami, Florida.

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This dissertation was prepared under the direction of the chairman of the candidate's supervisory committee and has been approved by all members of the committee. It was submitted to the Dean of the College of Arts and Sciences and to the Graduate Council and was approved as partial fulfillment of the requirements for the degree of Doctor of Philosophy.

August 11, 1956

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